

Part 4: Short Description-Microcontrol Cl. 975 - 1 - 5

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1. General

The **MICROCONTROL** controls of the **DÜRKOPP ADLER 975 - 1 - 5** have as an integral part the comprehensive **MULTITEST** testing and monitoring system.

A microcomputer assumes the control tasks, monitors the sewing procedure and displays operator errors and malfunctions.

Special programs aid in making mechanical settings and make possible a quick inspection of the input and output elements without additional measuring equipment.

Errors and testing results are shown in a 2 x 16-digit display.

During fault-free operation the display shows information to the operating and the sewing sequences.

For program testing and error diagnosis it is possible to blank out the summation counter and to alternatively receive a cycle display of the parallel-operating PROM components for the left and right clamping tables as well as for the sewing process.

With an operator error or a malfunction the function sequence is interrupted. The cause is shown in the display by the appropriate error symbol. In most cases the error symbol disappears after the cause of the error is remedied and the **CLEAR** key pressed.

In some cases the main switch must be turned off when the error is corrected for safety reasons.

A number of error messages are meant only for the maintenance staff.

All functions can be called up and changed by pressing the appropriate key. The sewing unit must be in its base position for this.

When the sewing unit is turned on the controls conduct a number of self-tests. At this time the program and data memory and the display, among other things, are checked as to fault-free functioning.

After the sewing unit is turned off the set values for the individual functions are stored in the program and data memory (battery buffered) and automatically activated when next turned on again.



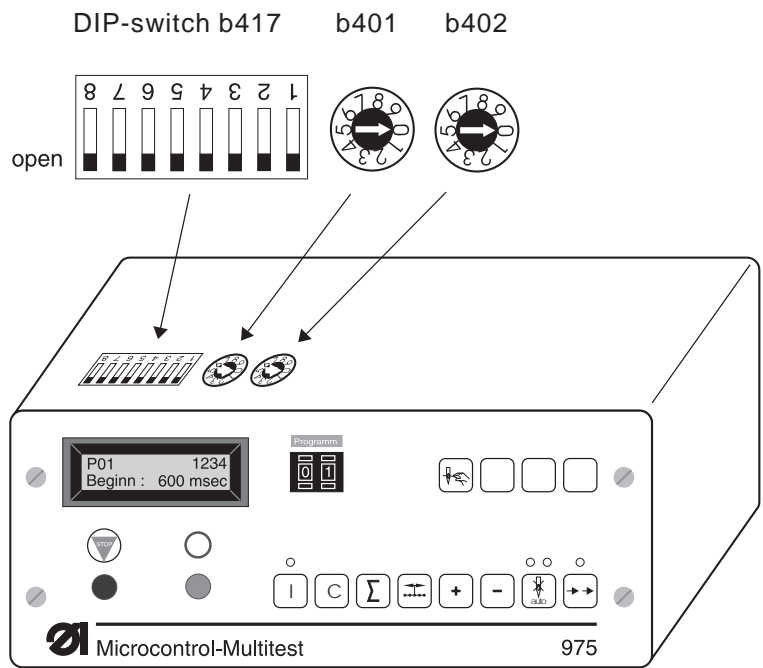
ATTENTION !

This short description of the Microcontrol 975 - 1 - 5 is valid for the Program Version **975A03** !

2. Description of the Controls



2.2 Internal Switches



On the controls behind the display there are 3 pre-selector switches for setting various machine parameters.



ATTENTION !

The switches are evaluated only once after the sewing unit is turned on.
After changing a switch position turn the main switch off and on again or press the “**STOP**” key.

DIP-switch b417

b417	Function	OFF	ON
1	Display	Piece counter	Program cycle
2	Sewing sequence	Normal	Continuous test
3...8	- Reserve -	_____	_____

Dials b401 and b402

With these switches the sewing rpms for the sewing of the house-shaped seam (b401) and for sewing at maximum rpm (b402) are set.

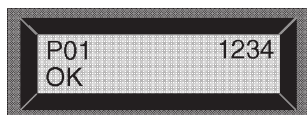
Switch position	Sewing rpm
0	960 min ⁻¹
1	1 280 min ⁻¹
2	1 700 min ⁻¹
3	2 260 min ⁻¹
4 - 9	3 000 min ⁻¹



2.3 Display

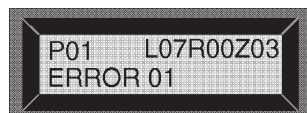
The Microcontrol controls are equipped with a 2 x 16-digit display. It shows program numbers, piece counts, status reports, error messages, seam beginning delay, among other items.

The sewing unit is ready for operation when the prompt to press the “**START**” key appears in the display.



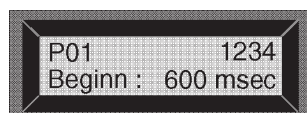
Example 1:

P01 = Program number
1234 = Piece count
OK = Status report



Example 2:

P01 = Program number
L07R00Z03 = Program cycle
ERROR 01 = Error message



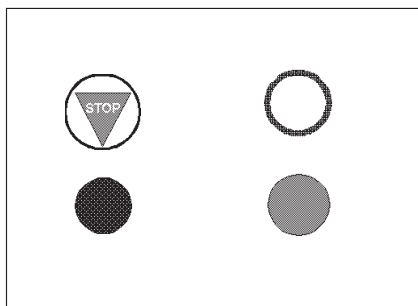
Example 3:

P01 = Program number
1234 = Piece counter
Begin: 600 msec = Seam beginning delay



3. Description of the Keys

3.1 “ STOP ” Key and “ O ” Key

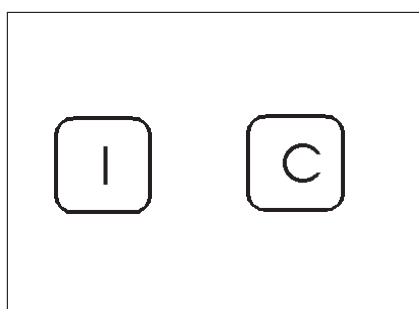


By pressing the “ **STOP** ” key all current procedures of the sewing unit and the clamping tables are immediately interrupted.

By pressing the “ **STOP** ” key the sewing, aid and testing programs set with the “ **PROGRAM** ” switch are activated.

By pressing the “ **O** ” key the selected output and input elements or the front panel elements in the various testing programs are activated.

3.2 “ START ” Key and “ CLEAR ” Key



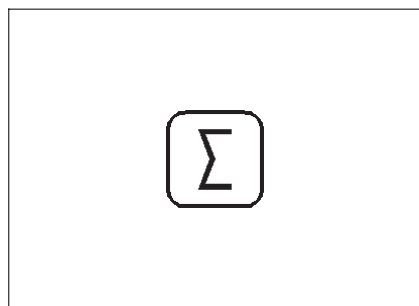
By pressing the “ **START** ” key the command for the initial run of the clamping tables is issued after the sewing unit is turned on.

By pressing the “ **START** ” key a STOP command is cancelled.

By pressing the “ **CLEAR** ” key slight errors are cancelled after the malfunction has been corrected.

If, after pressing the “ **CLEAR** ” key, the error message does not disappear, then the service technician must be notified.

3.3 “ Σ ” Key

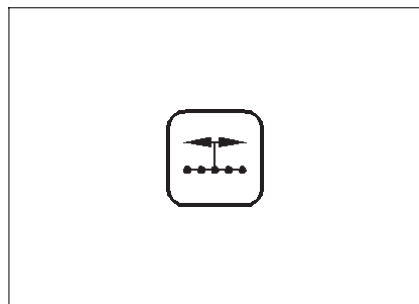


By pressing the “ Σ ” key the piece count (in the upper right of the display) is reset to **0000**.

The piece count shows the number of pieces finished since the last reset.

In program **40** the sewing process is activated by pressing the “ Σ ” key, if one of the two clamping tables is in sewing position.

3.4 “ SEAM BEGINNING ” Key



By pressing the “ **SEAM BEGINNING** ” key the set delay is shown in the display.

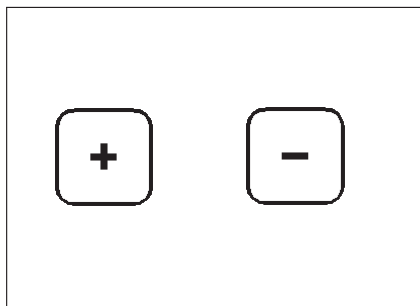
With the “ **SEAM BEGINNING** ” key held down, the delay can be set with the “ + ” and “ - ” keys.

Setting range: 0....600 msec

The set value remains in the memory even after the sewing unit is turned off.



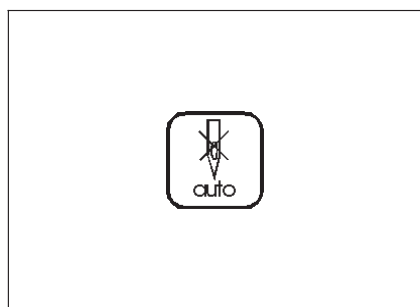
3.5 “ + ” and “ - ” Keys



With “ **SEAM BEGINNING** ” key held down the delay can be set using the “ + ” and “ - ” keys.

The set value remains stored in the memory even after the sewing unit is turned off.

3.6 “ SEWING SUPPRESSION ” Key

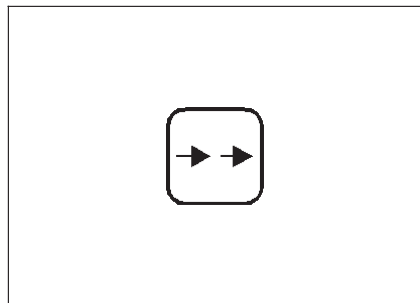


By pressing the “ **SEWING SUPPRESSION** ” key the cloth can be checked before being swung in for sewing.

By pressing the “ **SEWING SUPPRESSION** ” key again the function is cancelled.

When the function is active the LED above the key is lit.

3.7 “ DRY RUN / TERMINATE ” Key

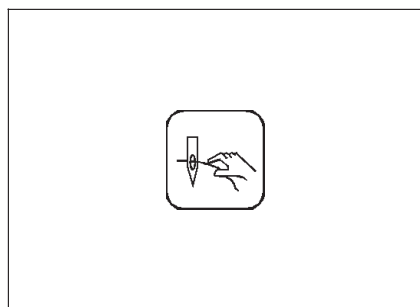


By pressing the “ **DRY RUN / TERMINATE** ” key the clamping table which is next to be swung in for sewing is not sewn (dry run).

If sewing is already occurring, then this is interrupted and the thread cut.

When the function is active the LED above the key is lit.

3.8 “ THREADING ” Key



By pressing the “ **THREADING** ” key the unit is automatically run into the threading position.

The “ **THREADING** ” key can only be used in program 01 (sewing) before a sewing process has been started, this is when the display shows “ **PRESS START** ”.

Turn the main switch off or press the “ **STOP** ” key in program 01.

See also the Program Description in the Operating Instructions !



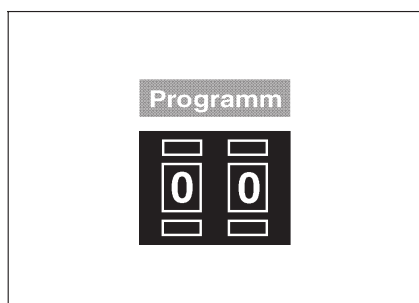
4. Selecting the Sewing and Testing Programs

The sewing and testing programs listed below are selected with the “**PROGRAM**” switch.

- Set the “**PROGRAM**” switch to the desired program.
- Turn the main switch on or press the “**STOP**” key.
The selected program is active.
- If “**P?**” appears in the display, then an invalid program number was set.
A sewing process running at the time that the “**STOP**” key is pressed will be terminated.
- Correct the setting and press the “**STOP**” key.

Program	Function
00	Display of the program version
01	Sewing program
40	Sewing in interval operation
41	Sewing at low rpm in interval operation
42	Sewing at house-shaped seam rpm
43	Sewing at maximum rpm
44	Raising and lowering the sewing head, needle plate and sewing foot
45	Display of the synchronizer position
59	Timer test and memory test
60	Continuity test
61	Test of the front panel elements
62	Test of the input elements
63	Selecting input elements
64	Selecting output elements
66	Positioning in the 2nd position
67	Positioning in the 1st position
68	Positioning with cutting

4.1 Display of the Program Version



- Set the “**PROGRAM**” switch to **00**.
- Press the “**STOP**” key.
The program is active. The lower line of the display shows the program version and a check sum.

e.g. **975A01** **0000**

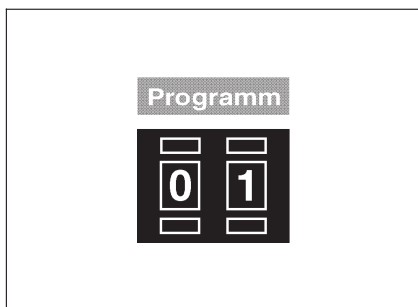
975 = Class designation of the sewing unit
A = Identification letter
01 = Version number
0000 = Check sum

By program versions with the same class designation and the same identification letter the higher version replaces all lower versions (Example: 975A03 replaces 975A01 and 975A02).

The check sum is meant only for the factory service staff. Specialists can see by this sum if the program memory (EPROM) of the sewing unit flawlessly contains the complete program.



4.2 Sewing Program

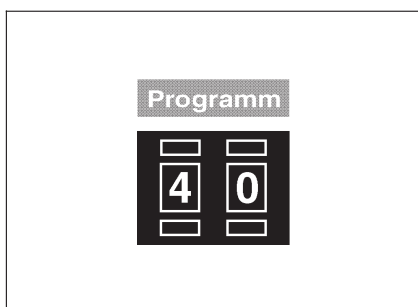


Only the sewing program 01 can be called up.

The work sequence is comprehensively described in the Operating Instructions.

- Set the “ **PROGRAM** ” switch to **01**.
- Turn the main switch on or press the “ **STOP** ” key.
The sewing program is active.

4.3 Sewing in Interval Operation

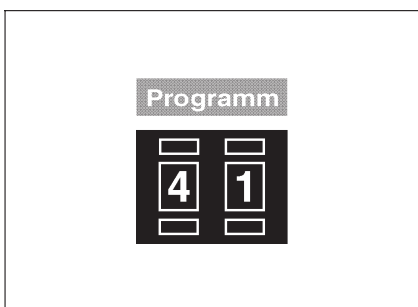


This program is generally the same as program 01.

The clamping table is, however, controlled in interval operation.

- Set the “ **PROGRAM** ” switch to **40**.
- Press the “ **STOP** ” key.
The program is activated.
- Press the “ **REPEAT / INTERVAL** ” key on the clamping table.
While the key is pressed the folding sequence is initiated.
If the key is released the folding device immediately ceases movement.
- In the sewing position press the “ Σ ” key.
The sewing process is initiated.
If the “ Σ ” key is not pressed at this point, then the folding sequence runs completely through to the end (base position) without sewing.

4.4 Sewing at Low Rpm in Interval Operation

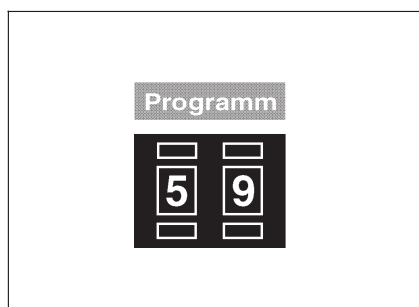


This program is identical with program 40. Sewing, however, occurs only at low rpm (house-shaped seam rpm).

- Set the “ **PROGRAM** ” switch to **41**.
- Press the “ **STOP** ” key.
The program is activated.
- Press the “ **REPEAT / INTERVAL** ” key on the clamping table.
While the key is pressed the folding sequence is initiated.
If the key is released the folding device immediately ceases movement.
- In the sewing position press the “ Σ ” key.
The sewing process is initiated.
If the “ Σ ” key is not pressed at this point the folding sequence will run through to the end (base position) without sewing.



4.9 Timer Test and Memory Test

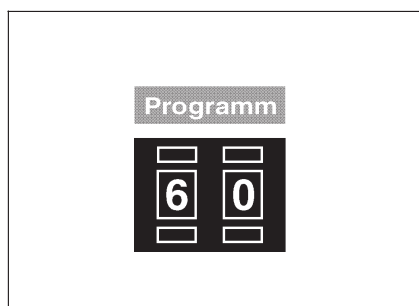


Program 59 checks the working memory (RAM) and all timer switchings of the controls.

- Set the “ **PROGRAM** ” switch to **59**.
- Press the “ **STOP** ” key.
The program is activated.

Display	Explanation
OK	Working memory and all timer switchings are okay
ERROR 0	RAM error
ERROR 6	Timer 1 defective
ERROR 7	Timer 2 defective
ERROR 8	Timer 3 defective (expansion card)
ERROR 9	Timer 4 defective (expansion card)

4.10 Continuity Test

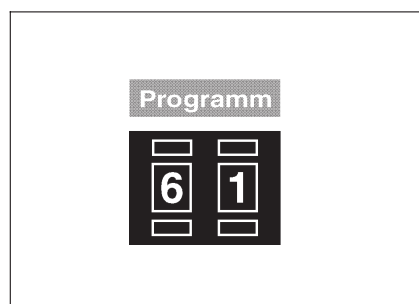


Program 60 checks if the 24 V electrical supply delivers current with the output drivers turned off. Then the program checks all existing output elements (including output drivers and installation) as to continuity.

- Set the “ **PROGRAM** ” switch to **60**.
- Press the “ **STOP** ” key.
The program is activated.

Display	Explanation
V?	Short circuit in the installation or one of the output drivers is defective.
OK	All circuits have continuity
s23 (Example)	Interruption in the output element s23, in its installation or driver. Output element s23 does not exist because it is part of the special accessories. Continue the check at the next element by pressing the “ Σ ” key.

4.11 Test of the Front Panel Elements



Program 61 checks the front panel elements.

- Set the “ **PROGRAM** ” switch to **61**.
- Press the “ **STOP** ” key.
The program is activated.

Continued on the next page !

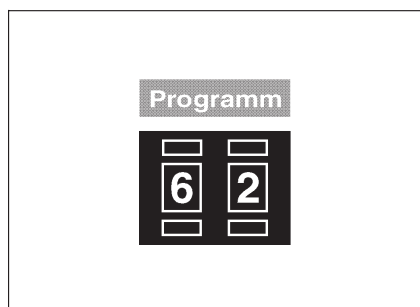


- Operate the pre-selector switch on the front panel.
The display shows the current setting value of the last operated pre-selector switch.
When pressing a key on the front panel (Exception: STOP key) the number assigned to this switch (1, 2, 4, 8) is shown.
- The light diodes on the front panel are selected by code number.
The short designations of the circuit diagram (1...8) serve as the code numbers.
The light diodes are turned on by pressing the “ O ” key.

Switch	Function	Designation	
b417 b401 b402 b413/b412 b416	Function switch House-shaped seam rpm Maximum rpm Program switch Stop (Key 13)	PROGRAM STOP	
Key	Function	Symbol	Indicator
b415	Stop (Off)	○ ●	
b825	Threading		
b814	Relocate seam beginning		display
b815	Reset counter		display
b816	Clear (Cancel)		
b817	Start (On)		LED
b818	Dry run / Terminate		LED
b819	Sewing suppression		LED
b820	Minus		
b821	Plus		
LED	Function Indicator		
H3	Indicator “ Sewing suppression ”		
H4	Indicator “ Start ready ”		
H5	Indicator “ Dry run ”		
H6	Indicator “ Sewing suppression ”		



4.12 Test of the Input Elements



Program 62 shows the switching status of any desired input element.

- Set the “ **PROGRAM** ” switch to **62**.
- Press the “ **STOP** ” key.
The program is activated.
- Press the input element to be checked.
The display shows the circuit diagram designation and the switching status of the input element (e.g. “ +B25 ”).
The display changes when the switching status of any other input element is changed.

The switching status “ + ” means:

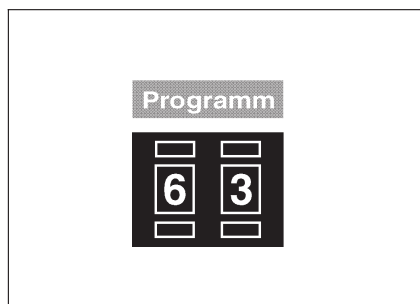
by contact switches	= open contact
by proximity switches	= Metal in front of the switches
by reflected light barrier	= No reflection
by light beam barrier	= Light beam not interrupted

4.13 Selecting Input Elements



ATTENTION !

All input elements have been carefully set at the factory.
Adjustment and correction may only be carried out by trained service personnel.



Program 63 sets the input elements.

- Set the “ **PROGRAM** ” switch to **63**.
- Press the “ **STOP** ” key.
The program is activated.
- Set the “ **PROGRAM** ” switch to the code number of the desired input element.
The short designations of the circuit diagram serve as the code numbers (see table). This does not apply for the keys on the front panel (see “ Test of the Front Panel Elements ”).
- The display shows the circuit diagram designation and the switching status of the input element (e.g. “ B14 ”).
- Adjust the input element (e.g. proximity switches) until the desired switching status is shown in the display.
The meaning of the switching statuses corresponds to the switching statuses in program P62.

The table for the input elements is to be found on the next page !



Input element	Function
b1	Right pedal
b2	Initiator-Cross seam/right
b3	Initiator-Sewing/base position right
b4	Initiator-Sewing/quickly right
b5	Initiator-Intermediate position/right clamping table
b6	Initiator-Sewing position/right clamping table
b7	Initiator-Base position/right clamping table
b8	Left pedal
b9	Initiator-Sewing/quickly left
b10	Initiator-Base position/left
b11	Initiator-Pinner/right (Option)
b12	Initiator-Pinner/left (Option)
b14	Phase monitor
b15	Reserve/right clamping table
b16	Initiator-Cross seam/left
b17	Limit switch-Sewing head/up
b18	Limit switch-Sewing head/down
b19	Limit switch-Needle plate/down
b20	Limit switch-Needle plate/up
b21	Pressure monitor
b22	Key-Interval/right clamping table
b23	Hold-down forward/right clamping table
b24	Hold-down to the back/right clamping table
b25	Interior slide/right clamping table
b26	Key-interval/left clamping table
b27	Hold-down to the back/left clamping table
b28	Hold-down forward/left clamping table
b29	Interior slide/left clamping table
b30	Base position/left clamping table
b31	Initiator-Sewing position/left clamping table
b32	Initiator-Intermediate position/left clamping table
b44	Light barrier/left clamping table
b45	Light barrier/right clamping table



4.14 Selecting Output Elements



Caution Risk of Injury !

During function testing of the output elements do not reach into the running sewing unit.
Select your position so that no injury is possible.

Programm



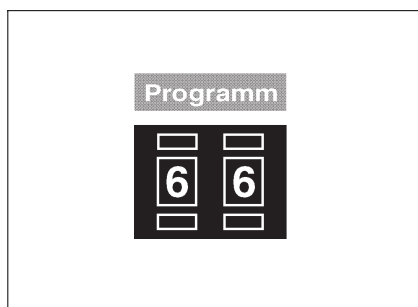
Program 64 tests the output elements.

- Set the “ **PROGRAM** ” switch to **64**.
- Press the “ **STOP** ” key.
The program is activated.
- Set the “ **PROGRAM** ” switch to the code number of the desired output element.
The short designations of the circuit diagram apply as the code numbers (see table).
- Press the “ **O** ” key.
The output element is turned on or off.

Output element	Function
s1	Brake-Left clamping table/Output 1
s2	Brake-Left clamping table/Output 2
s3	Coupling-Left clamping table/Output 1
s4	Coupling-Left clamping table/Output 2
s7	Valve-Pinner/right clamping table
s8	Valve-Pinner/left clamping table
s9	Thread tension (Power output)
s10	Thread trimmer (Power output)
s11	Coupling-Sewing head (Power output)
s12	Coupling-Left corpus (Power output)
s14	Coupling-Right corpus (Power output)
s17	Brake-Right clamping table/Output 1
s18	Coupling-Right clamping table/Output 2
s19	Coupling-Right clamping table/Output 2
s21	Brake-Right clamping table/Output 2
s22	Valve-Sewing head/raise
s23	Valve-Brake
s24	Valve-Sewing foot/lower
s25	Valve-Sewing head/lower
s26	Valve-Sewing foot/raise
s30	Valve-Beard clamp/Left clamping table
s31	Valve-Beard clamp/Right clamping table



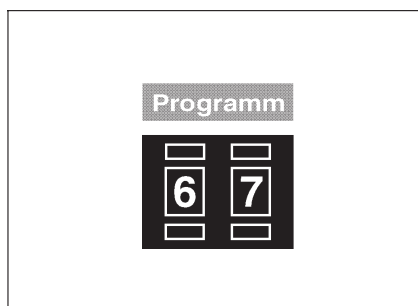
4.15 Positioning in the 2nd Position



Program 66 runs the needle into the 2nd position.

- Set the “ **PROGRAM** ” switch to **66**.
- Press the “ **STOP** ” key.
The program is activated. Display shows “ **SW ?** ”.
- Set the drive rpm with the “ **PROGRAM** ” switch at **01** to **13**.
01 = Minimum rpm
13 = Maximum rpm
- Press the “ **O** ” key.
The drive runs at the desired rpm.
The actual rpm is displayed after a few seconds.
- Release the “ **O** ” key.
The needle is positioned in the 2nd position (thread lever high position).

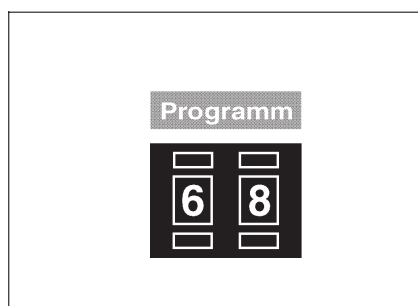
4.16 Positioning in the 1st Position



Program 67 runs the needle into the 1st position.

- Set the “ **PROGRAM** ” switch to **67**.
- Press the “ **STOP** ” key.
The program is activated. The display shows “ **SW ?** ”.
- Set the drive rpm with the “ **PROGRAM** ” switch at **01** to **13**.
01 = Minimum rpm
13 = Maximum rpm
- Press the “ **O** ” key.
The drive runs at with the desired rpm.
The actual rpm is displayed after a few seconds.
- Release the “ **O** ” key.
The needle is positioned in the 1st position.

4.17 Positioning in the 1st and 2nd Position



Program 68 positions the needle in the 1st and 2nd positions.

- Set the “ **PROGRAM** ” switch to **68**.
- Press the “ **STOP** ” key.
The program is activated. The display shows “ **SW ?** ”.
- Set the drive rpm with the “ **PROGRAM** ” switch at **01** to **13**.
01 = Minimum rpm
13 = Maximum rpm
- Press the “ **O** ” key.
The drive runs at the desired rpm.
The actual rpm is displayed after a few seconds.
- Release the “ **O** ” key.
The needle is positioned in the 1st position. Then, after a short pause, the needle is positioned in the 2nd position.



5. Function Displays and Error Messages

5.1 Display of the Operating Aids

Display	Explanation	Remedy
P? 975A01 $\Sigma = \text{xxxx}$	Invalid program selected Display of the program version Piece counter	Reset the “ Program ” switch ----- -----

5.2 Error Messages of the Sewing Program

Display	Explanation	Remedy
ERROR 10	Phase direction of rotation incorrect	Power supply x1: change phases L1+L2 Bridge X3.1 - X3.2 is missing. See Component Connection Diagram !
ERROR 11	Air pressure too low	Increase the compressed air supply.
ERROR 12	Base position-left is missing	Bring the clamping table into the base position with the hand crank.
ERROR 13	Base position-right is missing	Bring the clamping table into the base position with the hand crank.
ERROR 14	Thread lever is not up By units with 2 synchronizers, also synchronizers interchanged	Turn the handwheel. Interchange synchronizer.
ERROR 15	Hold-down/left is displaced	Bring into the base position manually.
ERROR 16	Hold-down/right is displaced	Bring into the base position manually.
ERROR 17	Machine head is not up (inspite of having been called up)	Check the cylinder.
ERROR 18	Needle plate is not down (inspite of having been called up)	Check the cylinder
ERROR 19	Light barrier/left is not free	Remove sewing piece or foreign object.
ERROR 20	Light barrier/right is not free	Remove sewing piece or foreign object.
ERROR 21	Interior slide/left is not to the back	Bring into position manually.
ERROR 22	Interior slide/right is not to the back	Bring into position manually.
ERROR 23	Machine head is not down (inspite of having been called up)	Check the cylinder.
ERROR 24	Needle plate is not up (inspite of having been called up)	Check the cylinder.
ERROR 25	Keypad pressed when turning on	Re-start the sewing unit.
ERROR 26	Pedal/left pressed when turning on	Re-start the sewing unit.
ERROR 27	Pedal/right pressed when turning on	Re-start the sewing unit.
ERROR 28	Both switches/ hold-down left triggered	Check the limit switches.
ERROR 29	No switches/hold-down left triggered	Check the limit switches.
ERROR 30	Both switches/hold-down right triggered	Check the limit switches.
ERROR 31	No switches/hold-down right triggered	Check the limit switches.
ERROR 32	Both switches/needle plate triggered	Check the limit switches.
ERROR 33	No switches/needle plate triggered	Check the limit switches.

Continued on the next page !



Display	Explanation	Remedy
ERROR 34 ERROR 35	Both switches/sewing head triggered No switches/sewing head triggered	Check the limit switches. Check the limit switches.
ERROR 36 ERROR 37	More than 1 initiator on the left clamping table triggered. More than 1 initiator on the right clamping table triggered.	Check the initiators, switching disks and aluminium strips. Check the initiators, switching disks and aluminium strips.
ERROR 38 ERROR 39	Timing error Sewing position-left reached too late Timing error Sewing position left reached too soon	Check the coupling/ clamping table-left. Check the coupling/ clamping table-left.
ERROR 40 ERROR 41	Timing error Sewing position right reached too late Timing error Sewing position right reached too soon	Check the coupling/ clamping table-right. Check the coupling/ clamping table-right.
ERROR 42 ERROR 43	Sewing position-right left while sewing Sewing position-left left while sewing	Check the coupling (s18 / s19). Check the coupling (s3 / s4).
ERROR 44	Both large guide disks have left the base position	Check the aluminium strips, initiators and coupling/clamping table.
ERROR 45 ERROR 46	Interior slide-left does not move forward Interior slide-right does not move forward	Check the limit switches. Check the limit switches.
ERROR 47 ERROR 48	Thread lever error when leaving the base position of the large guide disk-left Thread lever error when leaving the base position of the large guide disk-right	Check the synchronizer and coupling/ machine head. Check the synchronizer and coupling/ machine head.
ERROR 49 ERROR 50	Synchronizer does not work correctly Sewing head is not down when sewing	Check the synchronizer. Check the limit switch on the sewing head.
ERROR 51 ERROR 52	Reasonableness error in the initiator evaluation of the large guide disk-left Reasonableness error in the initiator evaluation of the large guide disk-right	Check the initiators and aluminium strips. Check the initiators and aluminium strips.



5.3 Error Messages of the Controls

Display	Explanation	Remedy
DISP-Err	Display error when turning on	-----
ERROR 0	RAM error in program 59	Replace the controls
ERROR 2	Error in reading the front panel elements	Check the front panel elements
ERROR 3	Program switch defective	Replace the program switch
ERROR 4	Regulator card for sewing drive defective	Replace the controls
ERROR 5	Short voltage drops in the mains	Stabilize the voltage supply
ERROR 6	Timer 1 defective	Replace the controls
ERROR 7	Timer 2 defective	Replace the controls
ERROR 8	Timer 3 defective (expansion card)	Replace the expansion card
ERROR 9	Timer 4 defective (expansion card)	Replace the expansion card
ERR B...	Error in reading the input elements: Defective or incorrectly set limit switches are shown in the display by their circuit diagram designations (e.g. " ERR B31 ")	Replace defective switches Reset the switches
no SIO ERR	The controls have no SIO component Interruption in the SIO send/receive loop	Press the STOP key Press the STOP key